

Claims:

1. An active assembly apparatus of a planar lightguide circuit for aiming an optical transmitter at a transmitting core of a planar lightguide circuit, the active assembly apparatus comprising:

an optical receiving device coupling with an end of the transmitting core to receive optical signals from the transmitting core;

a feedback control device coupling with the optical receiving device and the optical transmitter, the feedback control device controlling the optical transmitter to transmit the optical signals to the optical transmitting core; and

a displacement device coupling with the feedback control device and the optical transmitter, the optical transmitter moving to a position by way of the displacement device according to a output voltage from the feedback control device, wherein the displacement device is made of a piezoelectric substrate and the optical receiving device receives the optical signals with maximum strength at the position.

2. The active assembly apparatus of claim 1, wherein the optical transmitter comprises a light emitting diode (LED).

3. The active assembly apparatus of claim 1, wherein the optical transmitter comprises a laser diode.

4. The active assembly apparatus of claim 1, wherein the piezoelectric substrate comprises quartz.

5. The active assembly apparatus of claim 1, wherein the piezoelectric substrate comprises a piezoelectric ceramic.

6. The active assembly apparatus of claim 1, wherein the piezoelectric substrate comprises a piezoelectric polymer.

7. The active assembly apparatus of claim 1, wherein the planar lightguide circuit further comprises a wavelength division multiplexer (WDM) filter to reflect the optical signals.

8. An active assembly apparatus of planar lightguide circuit for aiming an optical transmitter and an optical receiver at a transmitting core of a planar lightguide circuit, the active assembly apparatus comprising:

- an optical receiving and transmitting device coupling with an end of the transmitting core to transmit first optical signals to the transmitting core and receive second optical signals from the transmitting core;

- a feedback control device coupling with the optical receiving and transmitting device;

- a first displacement device coupling with the feedback control device and the optical transmitter, the first displacement device moving the optical transmitter to a transmitting position according to a first moving request from the feedback control device, wherein the first displacement device is made of a first piezoelectric substrate; and

- a second displacement device coupling with the feedback control device and the optical receiver, the second displacement device moving the optical receiver to a receiving position according to a second moving request from the feedback control device, wherein the second displacement device is made of a second piezoelectric substrate, while the active assembly apparatus performs a process for aiming the optical receiver at the transmitting core, the feedback control device controlling the optical receiving and transmitting device transmitting the first optical signals to the transmitting core, and while the active assembly apparatus performs a process for aiming the optical transmitter at the transmitting core, the feedback control device controlling the optical transmitter transmitting the second optical signals to the transmitting core.

9. The active assembly apparatus of claim 8, wherein the first displacement adjusts the optical transmitter to the transmitting position where the optical receiving and transmitting device receives the second optical signals with a maximum strength.
10. The active assembly apparatus of claim 8, wherein the second displacement adjusts the optical receiver to the receiving position where the optical receiver receives the first optical signals with a maximum strength.
11. The active assembly apparatus of claim 8, wherein the optical transmitter comprises a light emitting diode (LED).
12. The active assembly apparatus of claim 8, wherein the optical transmitter comprises a laser diode.
13. The active assembly apparatus of claim 8, wherein the optical receiver comprises a photo diode.
14. The active assembly apparatus of claim 8, wherein the first piezoelectric substrate comprises quartz.
15. The active assembly apparatus of claim 8, wherein the first piezoelectric substrate comprises a piezoelectric ceramic.
16. The active assembly apparatus of claim 8, wherein the first piezoelectric substrate comprises a piezoelectric polymer.
17. The active assembly apparatus of claim 8, wherein the second piezoelectric substrate comprises quartz.

18. The active assembly apparatus of claim 8, wherein the second piezoelectric substrate comprises a piezoelectric ceramic.

19. The active assembly apparatus of claim 8, wherein the second piezoelectric substrate comprises a piezoelectric polymer.

20. The active assembly apparatus of claim 8, wherein the planar lightguide circuit further comprises a wavelength division multiplexer (WDM) filter to distill the first optical signals and reflect the second optical signals.